

NOTES ON BROMELIACEAE, XXIV

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UNITED STATES

TILLANDSIA BARTRAMII Ell. Bot. S. C. & Ga. 1: 379. 1817.
Tillandsia juncea sensu LeConte, Ann. Lyc. N. Y. 2: 130. 1826;
Mez in DC. Mon. 9: 676. 1896, quoad pl. Florid., non Poir.
? Tillandsia pinifolia LeConte, Ann. Lyc. N. Y. 2: 131. 1826.
Tillandsia tenuifolia sensu Mez in DC. Mon. 9: 674. 1896; Small,
Fl. Se. U. S. 245. 1903, quoad syn. Tillandsia bartramii
Ell.

Tillandsia simulata Small, Man. Se. Fl. 270, 1503. 1933.
Tillandsia myriophylla Small, Man. Se. Fl. 270, 1503. 1933.

UNITED STATES: GEORGIA: On old trees in the Mortar Swamp,
Liberty County, Lewis LeConte s. n. (CHARL, holotype, phot. GH;
NY, isotype).

FLORIDA: Manatee River (Manatee County), June 1878, A. P.
Garber s. n. (NY, lectotype of Tillandsia simulata Small; US,
isotype). Hammock south of Brooksville, (Hernando County), May
13, 1931, J. K. Small & E. J. Alexander s. n. (NY, type of Til-
landsia myriophylla Small).

In the extreme southeastern United States, the group of spe-
cies in Tillandsia subgenus Tillandsia with very narrow fascicu-
late leaves is extremely confused and confusing, and I fear that
my efforts in the North American Flora in 1938 did little to im-
prove the situation. There, following previous authors, I mis-
applied T. juncea (R. & P.) Poir., a species that has a very
densely digitate involucrate inflorescence and that ranges from
Mexico and the West Indies to Peru and Bolivia. Up to the pre-
sent, I have seen no authentic material of Tillandsia juncea from
Florida.

It is possible to separate T. setacea Sw. (T. tenuifolia
auctt., non L.) from the remainder of this complex on its leaves
alone, which have very narrow sheaths, and blades that are thin,
completely involute, strongly ribbed, and about 0.5 mm in diame-
ter at mid-point (Pl. I, fig. 1: Small & Mosier 5506), while
those of the remainder are crescent-shaped in section and at
least 1 mm in diameter at mid-point (Pl. I, fig. 2: LeConte). T.
setacea is limited to the southern half of Florida, while the re-
mainder of the complex is rare there but common in the northern
half and adjacent Georgia.

I have tried to find characters to separate the remainder of
this complex both in the descriptions of LeConte and in those of
Small and also independently, but so far in vain. The oldest
name is T. bartramii Ell. and judging from the descriptions, T.
pinifolia of LeConte belongs here, while his T. caespitosa ap-
pears to be a synonym of T. setacea. Types of two of Small's
species have been located as indicated above, but T. hystericina
remains a mystery with indications of relationship elsewhere be-

cause of the leaves with "stiff nearly knife-like tips".

In conclusion I should say that for some years research has been going on with the purpose of distinguishing entities in this complex, but until that is successful there is no choice but to use T. setacea and T. bartramii for the southern and northern species respectively.

TILLANDSIA FASCICULATA Sw. var. CLAVISPICA Mez in DC. Mon. Phan. 9: 682. 1896.

Tillandsia bracteata Chapm. Fl. So. U. S. 471. 1860, non Vell. 1825.

UNITED STATES: FLORIDA: "South Florida", Chapman s. n. (NY, lectotype of Tillandsia bracteata Chapm.).

Chapman's description of his Tillandsia bracteata is so ambiguous that it is impossible to place it among the few species of Florida without material, and that is poorly labelled. However, all material so labelled, whether by Chapman or later collectors, is T. fasciculata Sw. In Florida, the common variety of T. fasciculata and undoubtedly the major element in Chapman's species is var. densispica Mez, but it is interesting to note the occurrence of the common Cuban var. clavispica Mez in southern Florida and so I am choosing the lectotype in the latter variety. After all, T. bracteata Chapman is a later homonym and consequently its typification is of minimal importance.

TILLANDSIA INCURVA Griseb. Nachr. Ges. Wiss. Goett. "1864": 15. 1865.

My Florida record for Tillandsia incurva Griseb. (North American Flora 19: 148. 1938) was based upon an unnumbered specimen collected by Blodgett at Key West (NY). Although the form of its inflorescence very closely resembles that of T. incurva, a careful restudy shows that it can not belong to that species because of its carinate short-connate posterior sepals and narrower paler leaf-sheaths. I now believe that the specimen is a hybrid of a dominant T. valenzuelana A. Rich. with some larger species such as T. fasciculata Sw. that would account for the much larger floral bracts and sepals.

In any event, T. incurva should be removed from the list of Florida species. Whether there will ever be an authentic record is dubious, for although Cuban species like T. pruinosa are discovered in southern Florida from time to time, T. incurva is mainly a species of mountain rainforest and could scarcely find a suitable habitat there.

MEXICO

PITCAIRNIA BREEDLOVEI L. B. Smith, sp. nov.

P. jimenezii L. B. Smith atque P. xanthocalyx Mart. in systema mea proxima sed sepalis posterioribus alato-carinatis differt.

PLANT with a short erect stem covered with old leaf-sheaths, flowering 66-86 cm high. LEAVES all alike, fasciculate at the apex of the stem, to 5 dm long, entire; sheaths suborbicular,

15-20 mm long, dark castaneous, glabrous at least with age; blades linear, slightly contracted at base, filiform-acuminate, 10-15 mm wide, covered with fine appressed cinereous scales beneath, glabrous above. SCAPE erect, slender, white-flocculose; scape-bracts erect, the lowest subfoliaceous and imbricate, the highest narrowly triangular, filiform-laminate, shorter than the internodes. INFLORESCENCE few-branched, lax, laxly white-flocculose; primary bracts narrowly triangular, much shorter than the naked sterile bases of the short few-flowered lateral branches; floral bracts ovate, acuminate, shorter than the slender spreading 13 mm long pedicels. SEPALS oblong, rounded and apiculate, 16 mm long, the anterior ecarinate, the posterior alate-carinate. PETALS 4 cm long, pale yellow, bearing an oblong truncate scale at base. STAMENS included. OVARY 3/5 superior. SEEDS shortly bicaudate. Pl. I, fig. 3: Flower x 1; fig. 4: Anterior sepal x 1; fig. 5: Posterior sepal x 1.

MEXICO: Chiapas: Mun. Ixtapa: On rocks, steep slope with Quercus, along Mexican Highway 190 in the Zinacantán paraje of Muctajoc, alt. 1050 m, 30 October 1965, D. E. Breedlove 13991 (US, type; DS). Chiapa, alt. 1350 m, M. B. Foster 2963 (US, paratype)

SALVADOR

GREIGIA ROHWEDERI L. B. Smith, sp. nov.

A G. van-hyningii L. B. Smith, cujus bracteas valde imitans, foliorum vaginis inconspicuis, bracteis primariis pallidioribus serratisque differt.

PLANT known only from fragments. LEAVES over 2 meters long, covered beneath with coarse pale appressed scales, soon glabrous above; sheaths inconspicuous, pale brown toward base; blades linear, acuminate, somewhat narrowed toward base, to 38 mm wide, green, bearing a pale median stripe when dry, laxly and subregularly serrate with pale teeth 0.5 mm long. SCAPES to 6 cm long, strongly flattened and alate; scape-bracts narrowly triangular, acuminate, pungent, 5-8 cm long, pale castaneous, sparsely pale-lepidote, entire. INFLORESCENCES complanate-capitate, compound, 6 cm high; primary bracts like the scape-bracts but serrate; floral bracts narrowly lance-triangular, 33 mm long, thin except for the pungent castaneous apex, entire, sparsely pale-lepidote. SEPALS like the floral bracts, 23 mm long. Pl. I, fig. 6: Primary bract x 1; fig. 7: Sepal x 1.

SALVADOR: Santa Ana: Epiphytic and terrestrial in cloud forest Hacienda Montecristo, north of Metapañ, alt. 2200 m, 27 August 1951, O. Rohweder no. El Salvador 526 (F, type; phot. US).

It is very difficult to judge specific limits in Greigia because of the very scanty collecting and the fragmentary nature of most collections. However, additional material of G. van-hyningii has confirmed the importance of the characters of dark conspicuous leaf-sheaths, dark leaf-spines, and acuminate dark castaneous mostly entire primary bracts, and thus the characters taken to distinguish G. rohweri seem reasonably secure.

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VENEZUELA

PITCAIRNIA ALTENSTEINII (Lk., Kl. & Otto) Lem. var. MINOR L. B. Smith, var. nov.

A var. altensteinii scapi bracteis superioribus quam internodiis brevioribus, inflorescentia brevi, basi latibracteata differt.

SCAPE-BRACTS shorter than the upper internodes. INFLORESCENCE short-cylindric or subglobose, to 11 cm long; basal floral bracts broad. Pl. I, fig. 8: Inflorescence x 1/2.

VENEZUELA: Aragua: Alto de Choroní, alt. 800-1400 m, V. M. Badillo 1920 (Universidad Central de Venezuela). Same, alt. 800-1300 m, 8 May 1949, Badillo 1928 (UCVEN). Same, 12 June 1952, Schnee 953 (UCVEN). Same, terrestrial in rich soil in full sun, alt. 1950 m, 5-6 April 1962, T. R. Soderstrom 975 (US, type).

PUYA FLOCCOSA (Linden) E. Morr. var. COMPACTA L. B. Smith, var. nov.

A var. floccosa inflorescentiae ramis brevibus dense florigeris bracteis primarias subduplo superantibus differt.

INFLORESCENCE with branches 2-3 cm long including the naked sterile base, about twice as long as the serrulate rose primary bracts. Pl. I, fig. 9: Branch x 1/2.

VENEZUELA: Mérida: On rocks, July 1846, Funck & Schlim 1055 (P, type).

COLOMBIA

GUZMANIA BICOLOR L. B. Smith, sp. nov.

A G. graciliore (André) Mez, cui affinis, foliorum vaginis omnino castaneis haud striatis, laminis subduplo angustioribus, scapi bracteis omnibus longe laminatis differt.

PLANT caulescent; stem at least 35 cm long; flowering shoot 20 cm long. LEAVES erect, very densely imbricate, 20-25 cm long; sheaths ovate, 4 cm long, dark castaneous and covered with fine closely appressed scales beneath; blades linear, acuminate, flat, 7 mm wide, pale and appressed-lepidote above, dark and glabrous beneath. SCAPE erect, very slender; scape-bracts erect, densely imbricate, foliaceous but reduced. INFLORESCENCE laxly bipinnate 9 cm long, sparsely white-lepidote; primary bracts spreading, broadly ovate, red, shorter than the spikes but the lowest with foliaceous blades exceeding them; spikes more or less secund, subdensely 3-4-flowered, to 27 mm long including the naked sterile base, yellow; floral bracts elliptic, 9 mm long, thin, nerved, the lower carinate and incurved; flowers sessile, erect, more than 2-ranked. SEPALS oblong, obtuse, 11 mm long, equally connate for 4 mm, carinate toward base. PETALS 20 mm long. Pl. I, fig. 10: Branch x 1/2; fig. 11: Sepals x 1.

COLOMBIA: Valle: Rocky hillside near quebrada, in forest near km 58 on the highway between Cali and Buenaventura, 12 August 1965, F. A. Barkley & L. E. Willard 35472 (US, type).

BRAZIL

AECHMEA BAHIANA L. B. Smith, sp. nov.

Ae. tomentosa Mez atque Ae. stelligera L. B. Smith affinis, a priore bracteis primariis angustioribus, axibus gracilibus, a posteriore bracteis primariis omnibus magnis et ramos multo superantibus, a ambobus sepalis utrinque late alatis differt.

PLANT flowering over 1 m high. LEAVES 7 dm long; sheaths elliptic, ample, to 3 dm long, castaneous beneath toward base, subdensely vestite with appressed brown-centered scales; blades ligulate, acuminate, 7 cm wide, densely and finely purple-spotted, subdensely lepidote beneath, becoming glabrous above but essentially concolorous, subdensely serrate, the apical spines recurved, 2 mm long. SCAPE erect, slender, densely vestite with pale stellate appressed scales; scape-bracts densely imbricate and wholly covering the scape, the lowest subfoliaceous, the highest elliptic, apiculate, nearly 2 dm long, entire, chartaceous, red. INFLORESCENCE cylindric, over 3 dm long (immature), lax at least toward base, 3-pinnate, pale-lepidote except the petals and older sepals; primary bracts like the upper scape-bracts, divergent, decreasing evenly in size, much exceeding the short subdense branches; spikes 1-4 on each branch, subdensely few-flowered; floral bracts narrowly triangular, spinose-acuminate, shorter than the ovary; flowers sessile, apparently more than 2-ranked, suberect. SEPALS free, strongly asymmetric but with broad wings on both sides, 16 mm long including the 2 mm mucro. PETALS ca. 3 cm long, bearing 2 short dentate scales at base; blades elliptic, obtuse. STAMENS included; pollen nearly spherical, ca. 50 μ in diameter, reticulate, at least 6-porate. OVARY cylindric, 10 mm long; epigynous tube cylindric, 2.5 mm long. Pl. I, fig. 12: Branch x 1; fig. 13: Sepal x 1; fig. 14: Pollen x ca. 500.

BRAZIL: Bahia: Rio de Contas, Bom Jesus, August 1913, Luetzelburg 300 (M, type; phot. US).

BROMELIA EITENORUM L. B. Smith, sp. nov.

B. antiacantha Bertol. atque B. balansae Mez affinis, a priore bracteis florigeris sepalisque longis angustisque, a posteriore bracteis florigeris sepalisque haud carinatis, a ambobus habitu minore distinguenda.

PLANT stemless, flowering 8 dm high. LEAVES many in a bulbous rosette, 75 cm long; sheaths ample, 4 cm long, dark castaneous, densely and coarsely lepidote toward apex especially beneath, also serrulate; blades linear, acuminate, pungent, 40 mm wide, white-lepidote beneath especially between the nerves, soon glabrous above, laxly serrate with slender uncinatae brown 7 mm long spines. SCAPE erect, slender, covered with a persistent white tomentum; scape-bracts densely imbricate, the lowest foliaceous, the upper elliptic, reddish, bearing a short foliaceous blade. INFLORESCENCE subdensely bipinnate, subcylindric; axes white-tomentose; primary bracts elliptic, entire, the lowest short-laminate, the upper bladeless, about half as long as the few-

flowered fascicles, subchartaceous, soon glabrous; floral bracts oblong, obtuse, 2 cm long, about equaling the ovaries, thin, ecarinate, white, soon glabrous; flowers subsessile. SEPALS like the floral bracts, 15 mm long. PETALS erect, 23 mm long, glabrous, white at base, dark dull purple above. STAMENS included; filament-tube 8 mm long. OVARY slenderly ellipsoid, 2 cm long, white-flocculose. FRUIT broadly ellipsoid to 4 cm long, nearly even. Pl. I, fig. 15: Branch x 1/2; fig. 16: Sepal x 1.

BRAZIL; Maranhão: Mun. Lorêto: Edge of brook in flat "chapada" or semi-closed woodland, "Ilha de Balsas" region, between the Rios Balsas and Parnaíba, about 35 km south of Lorêto, ca. 7° 23' S, 45° 4' W, alt. 300 m, 15 April 1962, George & Liene T. Eiten 4312 (US, type; flowering); same, 3 April 1962, Eiten 3974 (US, fruit).

ORTHOPHYTUM Beer, Flora 37: 347. 1854; L. B. Smith, Brom. Brazil in Smithsonian Misc. Coll. 126: 179. 1955.

Prantleia Mez in Mart. Fl. Bras. 3, pt. 3: 257. 1891.

Sincoraea Ule, Bot. Jahrb. 42: 191. 1908.

Cryptanthopsis Ule, Bot. Jahrb. 42: 193. 1908.

Six additional species of Orthophytum have been discovered since my previous work, so a new synopsis is needed to show their relationship. Except for the caulescent habit of O. vagans, no new characters are added to this small genus by its more than fifty per cent increase in species. At the same time it is interesting to note that the discediting of citations from Goiás and Mato Grosso now limits the range of the genus to a strip from Minas Gerais and Espírito Santo to Bahia and Paraíba.

1. Inflorescence sunk in the center of the leaf-rosette or of the terminal leaves, compact; scape lacking or short and hidden by the leaf-sheaths.
2. Plant caulescent, branching; leaf-blades narrowly triangular, 5-10 mm wide. Espírito Santo.....1. O. vagans
2. Plant stemless, but sometimes stoloniferous. Bahia.
3. Leaf-blades linear, 30 cm long, the spines mostly antrorse; sepals narrowly triangular, 30 mm long.....2. O. navioides
3. Leaf-blades narrowly triangular, 3-6 cm long, maximally 5-15 mm wide, the spines recurved; sepals 14 mm long.
4. Leaf-blades only 5 mm wide, the spines 1 mm long; flowers short-pedicellate; sepals lanceolate, acute. 3. O. amoenum
4. Leaf-blades 11-15 mm wide, the spines 2-3 mm long; flowers sessile; sepals narrowly triangular, acuminate. 4. O. saxicola
1. Inflorescence either raised above the leaves on a distinct scape or itself elongate.
5. Inflorescence short and compact.
6. Spines of the leaf-blade recurved, 2-3 mm long; leaf-blade 3-6 cm long; inflorescence simple; floral bracts much exceeding the flowers, recurved. Bahia.....4. O. saxicola

- ..6. Spines of the leaf-blade predominantly antrorse; leaf-blades much larger.
7. Sepals oblong, 17-20 mm long, densely lanate; flowers fasciculate, inflorescence compound, subglobose. Minas Gerais.....5. O. mello-barretoii
7. Sepals narrowly triangular, 12-15 mm long, not strongly vestite.
8. Floral bracts straight, about equaling the flowers; flowers spicate; inflorescence digitate. Bahia. 6. O. rubrum
8. Floral bracts recurved, the lower ones distinctly longer than the flowers.
9. Inflorescence simple, spicate. Espirito Santo. 7. O. fosterianum
9. Inflorescence compound, densely corymbiform. Minas Gerais.....8. O. compactum
5. Inflorescence elongate, lax at least toward base.
10. Upper primary bracts elongate, many times exceeding the fascicles of flowers.
11. Scape-bracts and primary bracts with broadly ovate sheaths abruptly contracted into very narrowly triangular blades; inflorescence dense toward apex; scape elongate. Espirito Santo.....9. O. foliosum
11. Scape-bracts and primary bracts without distinct sheaths, ligulate or linear, acuminate; inflorescence almost wholly lax; scape short. Minas Gerais, Espirito Santo. 10. O. duartei
10. Upper primary bracts short, scarcely more than twice as long as the fascicles of flowers.
12. Scape-bracts lanceolate, abruptly acuminate; sepals 10 mm long. Minas Gerais.
13. Leaf-spines 8 mm long; inflorescence lanate especially on the axis.....11. O. leprosum
13. Leaf-spines 2 mm long; inflorescence glabrous. 12. O. glabrum
12. Scape-bracts linear-triangular, long-caudate.
14. Inflorescence simple, the bracts 1-flowered, but the lowest remote. Espirito Santo.....7. O. fosterianum
14. Inflorescence compound, the larger bracts with fascicles or spikes of axillary flowers.
15. Scales of the leaves wholly appressed, suborbicular, subentire; sepals 14-15 mm long.
16. Inflorescence dense for about half of its length. Bahia.....13. O. maracasense
16. Inflorescence lax except for the extreme apex. Espirito Santo.....14. O. sanctum
15. Scales of the leaves more or less spreading and lacerate
17. Sepals maximally 8-11 mm long; leaf-scales coarsely lacerate, subspreading, deciduous above with age.
17. Sepals maximally 14-15 mm long; leaf-scales finely and deeply lacerate, spreading, persistent on both sides. Minas Gerais.....16. O. magalhaesii

1. *O. VAGANS* M. B. Foster, *Bromel. Soc. Bull.* 10: 59, figs. 1960.

BRAZIL: Espirito Santo: Source unknown, cultivated in Rio de Janeiro, R. G. Wilson 578 (US, type).

2. *O. NAVIOIDES* (L. B. Smith) L. B. Smith, *Brom. Brazil in Smithsonian Misc. Coll.* 126: 34, 179. 1955. *Cryptanthopsis navioides* L. B. Smith, *Contr. Gray Herb.* 129: 31, pl. 3, figs. 4-6. 1940.

BRAZIL: Bahia: On perpendicular rocks above stream in isolated ravine, Jacobina, alt. 500 m, 16 June 1939, Foster 90 (GH, type; R, US).

3. *O. AMOENUM* (Ule) L. B. Smith, *Brom. Brazil in Smithsonian Misc. Coll.* 126: 33, 179. 1955. *Sincoraea amoena* Ule, *Bot. Jahrb.* 42: 191, fig. 1 A-F. 1908; Mez, *Pflanzenreich* IV. 32: 9, fig. 3. 1934. Pl. I, fig. 17: Flower x 1; fig. 18: Petal and stamens x 1 (after Ule).

BRAZIL: Bahia: On rocks, Serra do Sincora, alt. 1400 m, (November 1906), Ule 7106 (B, type).

4. *O. SAXICOLA* (Ule) L. B. Smith, *Brom. Brazil in Smithsonian Misc. Coll.* 126: 34, 179. 1955. *Cryptanthopsis saxicola* Ule, *Bot. Jahrb.* 42: 193, fig. 1 G-K. 1908. Pl. I, fig. 19: Flower x 1 (after Ule).

BRAZIL: Bahia: On rocks, near Maracas, alt. 1000 m, September 1906, Ule 7031 (B, type). Same, 21 October 1948, Foster 2471-A (US). Very dry table rock area between Bahia and Milagres, alt. 450 m, 18 October 1948, Foster 2441 (US).

Ule considered his genera *Sincoraea* and *Cryptanthopsis* as most closely related to the Chilean *Fascicularia*, apparently on the basis of the non-porate non-plicate pollen and the appendaged petals in that order. The sessile inflorescence was doubtless considered also. He distinguished both genera from *Fascicularia* by their adnate inner filaments, long styles, and highly adnate petal-scales. Ule must have been following Mez's 1896 monograph in giving this position to his genera, and Mez vindicated this action in the key to genera in his 1934 monograph.

I followed this system in describing *Cryptanthopsis navioides* in 1940, but in 1948 Mulford Foster collected material of *C. saxicola* that showed transition from the typical form in adverse conditions to a more luxuriant and distinctly scapose type indistinguishable from a dwarf *Orthophytum*. The reduction of *Sincoraea* and *Cryptanthopsis* to *Orthophytum* is based then on the unreliability of the pollen character which has failed to correlate with other floral characters in a number of cases, as well as on the positive characters of similarities of other floral structure and of geographical distribution.

5. *O. MELLO-BARRETOI* L. B. Smith, *Bol. Mus. Nac. Rio de Janeiro nov. ser. no. 15*: 2, pl. 1, figs. c-e. 1952.

BRAZIL: Minas Gerais: Mun. Jaboticatubas: Palacio, Serra do Cipó, km 127, 3 September 1933, Mello Barreto 2121 (R, type; US). Same, Mello Barreto 7665 (R). Serra do Cipo, Foster 631 (GH); Pires & Black 2719 (IAN).

6. *O. RUBRUM* L. B. Smith, *Brom. Brazil in Smithsonian Misc.*

Coll. 126: 34, 180, fig. 83. 1955.

BRAZIL: Bahia: Table Rock near Maracas, 1948, Foster 2444 (US, type).

7. *O. FOSTERIANUM* L. B. Smith, Bromel. Soc. Bull. 8: 24, fig. 1958.

BRAZIL: Espirito Santo: Near Santa Teresa, 26 October 1948, Foster 2487-A (US, type).

8. *O. COMPACTUM* L. B. Smith, sp. nov.

O. foliosum L. B. Smith valde simulans, sed inflorescentia omnino compacta haud interrupta, bracteis haud recurvato-serratis, sepalis minoribus differt.

PLANT with slender rhizomes; flowering shoot 2 dm high. LEAVES 50-65 cm long, covered beneath with finely divided whitish scales, soon glabrous above; sheaths small and inconspicuous; blades linear, acuminate, 23 mm wide, laxly serrate with antrorsely uncinata or spreading pale brown spines 1.5 mm long. SCAPE erect, 7 mm in diameter, white-flocculose; scape-bracts foliaceous, much exceeding the inflorescence. INFLORESCENCE densely compound from few-flowered fascicles, subglobose, 5 cm high, soon glabrous; lower primary bracts spreading, foliaceous, large, the upper broadly ovate, acuminate, serrate with spreading or antrorse spines; floral bracts like the upper primary bracts, about as long as the flowers, recurved, whitish; flowers sessile. SEPALS free, narrowly triangular, acuminate, 13 mm long, nerved, the posterior ones alate, PETALS white, bearing 2 highly adnate scales, the blades elliptic, obtuse. STAMENS included. OVARY narrowed at base, 8 mm high, strongly compressed and alate with the sepals. Pl. I, fig. 20: Flower x 1.

BRAZIL: Minas Gerais: Terrestrial on rocky slopes by the highway from Nanuque to Teofilo Otoni, 14 August 1965, R. P. Belem 1626 (US, type; hb. Univ. Brasilia).

9. *O. FOLIOSUM* L. B. Smith, Arquiv. Bot. Estado São Paulo nov. ser. 1: 58, pl. 74. 1941.

BRAZIL: Espirito Santo: On side of a rock in semi-moist condition but in full sun, Santa Teresa, 27 July 1939, Foster 288 (GH, R, US; one specimen of US erroneously cited in Brom. Brazil as no. 2487). Same, 6 August 1940, Foster 881 (GH, US; one specimen of GH erroneously cited in Brom. Brazil as no. 1079 from Camizão, Mato Grosso). Here Mulford Foster has conscientiously rectified an error that gave a very misleading idea of the geographic distribution of Orthophytum foliosum.

10. *O. DUARTEI* L. B. Smith, sp. nov.

A *O. folioso* L. B. Smith, cui parum affinis, scapi bracteis et bracteis primariis indistincte vaginatis, inflorescentia fere omnino laxa, scapo brevi, bracteis florigeris integris differt.

PLANT stemless but propagating by very slender rhizomes flowering 22 (16-26) cm high. LEAVES typically 23 cm long and 25 mm wide, covered with white appressed scales, becoming glabrous above; sheath scarcely broader than the blade, ovate; blade ligulate or linear, acuminate, laxly repand-serrate with spreading or antrorse broad flat spines 0.5-1.5 mm long. SCAPE erect, slender

very short, naked or with a few foliaceous bracts. INFLORESCENCE elongate, lax almost throughout, compound from few-flowered fascicles; primary bracts foliaceous, mostly large but the upper reduced; floral bracts straight, narrowly triangular, 10 mm long, exceeded by the sepals, entire, thin, nerved, pale-lepidote; flowers sessile. SEPALS like the floral bracts but lanceolate, mucronate, 10 mm long, the posterior ones alate. PETALS imperfectly known, slightly exceeding the sepals. Pl. I, fig. 21: Apex of inflorescence x 1/2; fig. 22: Flower x 1.

BRAZIL: Minas Gerais- Espirito Santo: In colonies in fields associated with other Bromeliaceae or with Velloziaceae, between Nanuque and northern Espirito Santo, 10 November 1953, A. P. Duarte 3910 (US, type; RB 94378). Rio Itaunas, 1953, A. P. Duarte s. n. (RB 94376). Same, cultivated, 7 November 1953, A. P. Duarte 3909 (RB, form with longer narrower leaves, possibly due to cultivation).

11. *O. LEPROSUM* (Mez) Mez in DC. Mon. Phan. 9: 117. 1896. Prantleia leprosa Mez in Mart. Fl. Bras. 3, pt. 3: 259, pl. 58, fig. 2. 1891.

BRAZIL: Without locality, Glaziou 14035 (K, US phot. 4184). Minas Gerais: Cachoeira do Inferno, Rio Jequetinhonha, (September 1820), Pohl 5229 (W, type, formerly cited as from Goiás). Banks of the Rio Mucuri, Nanuque, 10 February 1953, A. P. Duarte 3636, J. C. Gomes 422 (RB, US).

12. *O. GLABRUM* (Mez) Mez in DC. Mon. Phan. 9: 117. 1896. Prantleia glabra Mez in Mart. Fl. Bras. 3, pt. 3: 258, pl. 58, fig. 1. 1891; Pflanzenreich IV. 32: 72, fig. 19. 1934.

BRAZIL: Minas Gerais: São Miguel, Rio Jequetinhonha, (August 1820), Pohl 3436 (BR, type; GH phot. 2792).

13. *O. MARACASENSE* L. B. Smith, Brom. Brazil in Smithsonian Misc. Coll. 126: 33, 180, fig. 84. 1955.

BRAZIL: Bahia: Table Rock area near Maracás, alt. 900 m, 21 October 1948, Foster 2471 (US, type; US phot. 4245).

14. *O. SANCTUM* L. B. Smith, Bromel. Soc. Bull. 12: 32, fig. 1962.

BRAZIL: Espirito Santo: Near Santa Teresa, alt. 900 m, 7 August 1940, Foster 846 (US, type).

15. *O. DISJUNCTUM* L. B. Smith, Brom. Brazil in Smithsonian Misc. Coll. 126: 33, 180, fig. 85. 1955.

15a. Var. *DISJUNCTUM*. Flowering 35-50 cm high. Sepals 11 mm long.

BRAZIL: Paraíba: On rocks at Queimada, between Campina Grande and Caruarú (in Pernambuco), alt. 450 m, 11 October 1948, Foster 2419 (US, type). Pernambuco: Mun. Quipapa: Engenheiro Pelada, 12 July 1950, Silva & Leal 247 (RB, US).

15b. Var. *MINOR* L. B. Smith, Phytologia 7: 255. 1960. Flowering 15 cm high. Sepals 9 mm long.

BRAZIL: Without locality, Instituto Biologico da Bahia 1083 (RB 97607). Pernambuco: Mun. Quipapa: On granitic outcrop of mountain, Uzina Agua Branca, Fazenda Pelada, 12 July 1950, D. A. Lima 50-592 (IPA, type; US phot. 5700).

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16. *O. MAGALHAESII* L. B. Smith, sp. nov.

A *O. disjuncto* L. B. Smith, cui affinis, foliis lepidibus patentibus profunde laceratis utrinque vestitis, sepalis majoribus differt.

PLANT flowering over 55 cm high, its base unknown, LEAVES (or basal scape-bracts) 50 cm long, covered throughout with a dense felt of spreading finely divided white scales; sheaths obscure, evidenced mainly by fine or no serration; blades very narrowly triangular, caudate-acuminate, very laxly serrate with low antrorse spines. SCAPE erect, 5 mm in diameter, densely tomentose-lepidote; scape-bracts reduced upward but little changed in shape. INFLORESCENCE laxly compound, tomentose-lepidote, becoming glabrous with age; primary bracts subfoliaceous, all but the highest many times exceeding the globose axillary spikes; floral bracts triangular, recurved, exceeding the flowers, minutely serrate with flat spines. SEPALS free, narrowly triangular, spinose-acuminate, 14 mm long, nerved, the posterior ones alate. PETALS imperfectly known. Pl. I, fig. 23: Section of inflorescence x 1/2; fig. 24: Sepal x 1.

BRAZIL: Minas Gerais: Mun. Itambacuri: Ouro Verde, 9 May 1958, Mendes Magalhaes 19187 (Hb. Bradeanum 17950, type). Mun. Ataleia: In colonies on rock outcrop, Ouro Verde, 8 September 1958, Mendes Magalhaes 12035 (RB 111107).

Plate I

Fig. 1: *Tillandsia setacea* (Small & Mosier 5506), leaf-section x 25. 2: *T. bartramii* (LeConte), leaf-section x 25. 6, 7: *Greigia rohweri*. 8: *Pitcairnia altensteinii* var. *minor*. 9: *Buya floccosa* var. *compacta*. 10, 11: *Guzmania bicolor*. 12-14: *Aechmea bahiana*. 15, 16: *Bromelia eitenorum*. 17, 18: *Orthophytum amoenum*. 19: *O. saxicola*. 20: *O. compactum*. 21, 22: *O. duartei*. 23, 24: *O. magalhaesii*.

Plate I

